Reviewer’s report

Title: The rise in stunting in relation to avian influenza: a comparison of the 2005 and 2008 Egypt Demographic and Health Surveys

Version: 2 Date: 29 January 2015

Reviewer: Anjali Pai

Reviewer’s report:

Summary

This is a secondary analysis of the effects of the avian influenza outbreak in Egypt, leading to lack of availability of poultry and changes in nutritional intake, on stunting in childhood. It compares cross-sectional data from the Egyptian Demographic and Health surveys in 2005 and 2008 between Lower and Upper Egypt. According to the authors’ analysis, it can be concluded that the avian influenza outbreak in Lower Egypt led to reduced nutritional food intake in children, which was one of the factors that contributed to stunting. Poor nutrition in childhood and stunting are important public health issues as they can affect the health of children into adulthood, which can in turn lead to reduced productivity for individuals, their families and societies.

The authors recognise the public health problems associated with stunting and the significance of this in Egypt. They have completed a comprehensive literature review which provides a good context to the study, and have mostly appropriately acknowledged their sources of reference. The objective of the paper is clear. Statistical tests used - chi square and t-tests for unadjusted analysis, and logistic regression for multivariable analysis - are appropriate and fairly well described but require clarification (see comments below). Permission to use data was obtained. Suggestions for improvement/clarification on the results and discussion sections are included in comments below.

Overall, this paper has been written well with a reasonably good structure and formatting (except for comments mentioned below); however several essential and compulsory revisions are required. The manuscript may be re-considered for publishing after revisions have been made.

Discretionary Revisions:

1. The abstract provides a reasonably accurate summary of the paper. Consistency in displaying results in the abstract in terms of mentioning confidence intervals and p values is advisable for clarity.

2. The term ‘avian influenza’ and its abbreviation (AI) are both used throughout the paper. Suggest using only one for consistency.

3. ‘Figure 1’ is repeated twice in paragraph for ‘Conceptual framework’ (lines
84-91).

4. The full form of PSU is repeated twice before using the abbreviation (lines 112 – 115).

5. It is advisable to use full form for Length for age Z score (line 168).

6. The list of abbreviations than the authors have included will be more useful if in the initial part of the document (if acceptable as per journal rules).

7. Water and sanitation variables are mentioned in the text but not shown in the tables.

Minor Essential Revisions:

1. Consistent spacing between paragraphs and different sections of the paper, indentation of the first line of new paragraphs, and reconsideration of certain sub-headings (italics/bold, etc) is advisable to differentiate between sections (e.g. lines 187-189).

2. Two of the author affiliations have been marked as ‘2’ and ‘4’ has been missed.

3. The word ‘surveys’ is missing in line 71: “....Lower Egypt between the 2005 and 2008 Egypt Demographic and Health [6]....”

4. Clarification is required for the full form of EDHS and whether the ‘E’ of EDHS stands for Egypt or Egyptian? It is advisable to remain consistent and state abbreviation of a term when it is first used in the paper (and only use abbreviated form there on)

5. Figure 1 needs to be re-formatted so that the outlines of boxes do not overlap with the words.

6. The definition of ‘shiakas’ is repeated three times (lines 106, 112, 118). Using a different phrase to ‘defined as’ may clarify this.

7. Tables 2 and 3 require re-formatting. Suggest consistent line spacing/ column width/landscape layout and avoidance of splitting tables over two pages which can be a deterrent to the reader. In addition, re-ordering variables by child, maternal and household factors is advised to improve continuity for the reader.

8. The term ‘unadjusted analysis’ should replace ‘bivariate analysis’, and ‘multivariable’ should replace ‘multivariate’.

9. The statistical software package should be ‘Stata’ and not ‘STATA’ as it is not an abbreviation.

10. Line 276 needs to be amended: Stunting in greater proportion of males than females in 2005 is not significant (p=0.510).
11. There is no mention of analyses between mother’s BMI and stunting (tables 2&3) in the paper.

12. The statement “Declining dietary diversity....figure 3” should include mention of the years 2005 and 2008 to give the term ‘respectively’ meaning, and clarity to the sentence.

13. Grammatical corrections:
   a.Lines 382-383, ‘was reported’ should be deleted
   b.Lines 395-396 should be revised to “.....with large and significant decreases found in Lower Egypt and Upper Egypt.”

14. The paper would benefit from a subtitle of ‘Strengths and limitations’ under the discussion section.

15. Major Compulsory Revisions:

   1. Although the main aim of the paper (lines 80 to 83) is well defined, the title of the paper is not as focused as it does not specify the population of interest i.e. children aged between 6 and 59 months, or nutritional variables. Also the ‘rise’ in stunting was in Lower Egypt only, but the study is a comparison between Lower and Upper Egypt.

   For e.g. ‘Stunting in relation to avian influenza and nutrition in children under five years: a comparison of the 2005 and 2008 Egypt Demographic and Health Surveys’ addresses these points and is suggested as an alternative.

   2. The maternal level factors mentioned under methods (lines 199-204) do not tally with the variables in table 1. Only 6 maternal variables are mentioned although the author states ‘seven’.

   3. In table 1, ‘birth interval’ and ‘size at birth’ are mentioned as child level factors rather than ‘maternal level’ as stated in lines 202-203. ‘Consumption of food groups’ is not included in table 1 as a variable, but has been stated in line 204.

   4. The authors mention using Pearson’s chi square and t-tests (line 239) for unadjusted analysis. However it is unclear which results are represented by these tests in Tables 2 and 3.

   5. In the penultimate paragraph of the methods section, the authors mention that bivariate (unadjusted) and multivariate (multivariable) model analysis is presented for 2008 only in Lower Egypt. However tables 2 and 4 represent analysis for both 2005 and 2008 in Lower Egypt.

   6. It would have been useful if the term ‘variance inflation factor’ was explained in detail for better understanding (last paragraph of methods section).

   7. In the results section, the authors state “Mothers with birth intervals less than 24 months since a previous birth were significantly associated with increased stunting in Lower Egypt for 2008 (p=0.035) and 2005 (p =0.087)”. However from
Table 2 it is clear that for 2005 this is only true if comparing birth intervals less than 24 months to >48 months (all others are similar ~ 17%).

8. The authors fail to mention the other strength of using EDHS data which is it had a representative sample, including oversampling in remote areas.

9. The authors also do not mention the disadvantages of data collection through questionnaires (memory bias, incomplete data). Also, there is no mention of missing data and how this was adjusted in the analysis.

10. The authors have found a difference in the prevalence of stunting in two populations across two time periods. They claim that the rise in stunting in Lower Egypt is attributable to the avian influenza outbreak despite clearly stating in lines 263-264 that stunting coincided with the outbreak. Also only household ownership of poultry rather than avian influenza on an independent level has been measured. Changes in diet (apart from reduced consumption of poultry), reduced diversity of diet, and feeding practices could have happened despite the avian influenza outbreak. These in turn could be due to reasons such as lack of dietary education and health promotion (such as consumption of other animal products), increased availability and affordability of non-nutritious food in Lower Egypt can all be attributed to a rise in stunting (supported by evidence). In addition the impact of maternal and child health project in Upper Egypt may have contributed to better feeding practices and reduced stunting there. All this has been acknowledged in the paper (lines 444-468). The conclusion therefore that stunting in children under five years in Lower Egypt can be attributed to the avian influenza outbreak has been overstated.

11. It would be useful if the authors could mention the relevance of their findings applicable to other populations, and the usefulness of their research in the discussion/conclusion sections.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests